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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,120	02/05/2004	Igor A. Luzinov	CXU-383	3254
22827	7590	11/30/2004		
DORITY & MANNING, P.A. POST OFFICE BOX 1449 GREENVILLE, SC 29602-1449			EXAMINER JACKSON, MONIQUE R	
			ART UNIT 1773	PAPER NUMBER

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/773,120

Applicant(s)

LUZINOV ET AL.

Examiner

Monique R Jackson

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 28-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election without traverse of Group I, Claims 1-27, in the reply filed on 9/20/04 is acknowledged.
2. Claims 28-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9/20/04.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 27 recite the limitation "having a molecular weight of at least about 2000" however it is noted that the term "molecular weight" as recited is indefinite because it is unclear whether the term refers to a number average molecular weight, a weight average molecular weight, etc. It is also noted that the term "at least about 2000" is a relative term which renders the claim indefinite. The term "at least about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The Examiner notes that the term "at least" refers to a value greater than a particular end point however the term "about" refers to a value that may be above or below a particular point and does not refer to a set end point. Hence, a molecular weight of 1950 is "at least" 1900 which is "about" 2000 and therefore a molecular weight of 1950 is "at least about 2000" though it is

actually lower than 2000. Hence, one having ordinary skill in the art would not be reasonably apprised of the scope of the claimed invention and could not interpret the metes and bounds of the claim so as to understand how to avoid infringement.

5. Claims 6 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Though alternative expressions are permissive in the claims, they should be drafted in proper alternative format, i.e. “**selected from A, B or C**”; or in proper Markush claim format, i.e. “selected from the **group consisting of A, B and C**”. A claim that recites “selected from the group consisting of A, B or C” as in the instant claims is improper as recited in the prior office action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Afeyan et al (USPN 5,503,933.). Afeyan et al teach a surface modification utilizing an anchoring layer of poly(glycidyl methacrylate) covalently attached to a hydrophobic surface such as a PSDVB substrate wherein the resulting surface can be derivatized or crosslinked via the epoxy groups (Abstract; Col. 1, lines 58-Col. 2, line 6; Col. 3, lines 49-Col. 4, line 5; Figures.) Though Afeyan et al do not teach a molecular weight of at least 2000 of the poly(glycidyl methacrylate), it is well established in the art that molecular weight of a polymer is a result-

effective variable affecting the coating properties of the polymer and further affecting the mechanical properties of the resulting coating wherein one skilled in the art would have been motivated to utilize routine experimentation to determine the optimum molecular weight to provide the desired properties for a particular end use.

8. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filippou et al (USPN 6,706,320.) Filippou et al teach a process for modifying the surface of a substrate containing a polymeric material by contacting the surface with a modifying agent to bond the modifying agent to the surface wherein the process comprises providing a solution of the modifying agent in a solvent and subjecting the solution of the modifying agent to a zone of elevated temperature to vaporize the solvent and provide diffuse contact between the modifying agent and the surface of the substrate wherein the functionality of the modifying agent is chosen to provide good adhesion to the substrate and surface chemical reactivity for subsequent reaction with other material brought into contact with the surface modified substrate, wherein the surface of the substrate is preferably oxidized and wherein the heating range includes temperatures that fall within the instantly claimed range (Abstract; Col. 2-3; Col. 5, lines 15-19; Col. 6, lines 13-67; Col. 10, lines 46-65; Col. 12.) Filippou et al further teach that the process includes treating the surface of the substrate with a crosslinking agent reactive with the substrate modifying agent to provide a cross-linked polymer network grafted to the surface of the substrate wherein the extent of crosslinking can be controlled to allow a certain portion of reactive groups to remain uncross linked to provide bonding to paints or adhesives or allow reaction with another crosslinker (Col. 14, lines 45-Col. 15, line 9.) Filippou et al teach that the crosslinker may be an epoxy polymer comprising at least two oxirane groups such as polyglycidylmethacrylate and

may be applied by conventional methods including dip coating, spin coating, and gravure coating (Col. 17, lines 24-53; Col. 20.) Filippou et al further teach that the process provides a method to engineer on a polymeric surface a crosslinked surface containing highly reactive functional groups for multi step surface coupling of molecules possessing specific physico-chemical properties wherein the suitable compounds for the multi step surface coupling include compounds containing various reactive groups include epoxy and (meth)acrylate groups and wherein the compounds may be macromolecules with molecular weights ranging from a few hundred to a few million and wherein biomolecules may also be coupled to the surface of the substrate (Col. 22; lines 1-52.) The coated substrate may further be subjected to elevated temperatures or dried accordingly (Col. 23 and 25; Examples.) Hence, given the teachings of Filippou et al, one having ordinary skill in the art at the time of the invention would have been motivated to utilize a polymer comprising multiple epoxy groups and having a molecular weight within the instantly claimed range as the crosslinker to react with the surface modifying agent bound to the substrate surface and crosslink a portion of the epoxy groups so that the remaining epoxy groups can be further subjected to reaction with various other reactive compounds as desired based on the final end product as taught by Filippou et al. Though Filippou et al do not specifically teach the percentage of the epoxy groups that are reacted with the functional groups of the surface modifying agent and the percentage crosslinked, Filippou et al do teach that the ratio of the polyamine compound to the crosslinker may be 100:1 to 1:100 and that crosslinking can be controlled so that there may be functional groups remaining for multi step surface grafting wherein one having ordinary skill in the art at the time of the invention would have been motivated to utilize routine experimentation to determine the optimum percentage of epoxy

groups to react with the surface modifying agent and to crosslink to provide the desired adhesion and graft properties for a particular end use.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ducoffre et al (USPN 6,649,672) teach carboxyl-functional nanoparticles reacted with epoxy-functional binders which covalently bond to the carboxyl groups and further crosslink. Weinkauff et al (USPN 5,405,700) teach epoxy-polyketone polymer composites that are produced by reacting a polyketone substrate with a multifunctional amine which is further reacted with an epoxy resin that is further cured.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R Jackson whose telephone number is 571-272-1508. The examiner can normally be reached on Mondays-Thursdays, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Monique R. Jackson
Primary Examiner, TC 1700
November 29, 2004